



# Space for Food Security

Geodata for Agriculture & Water  
G4AW

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Netherlands  
**Space**  
Office



# Challenge

- World population
- Food production
- Climate change
  
- **Need: better informed decisions at farmer level**





# FAO - WATER PRODUCTIVITY DATABASE

## Data components

	Dataset	Resolution	Region of Interest
Water Productivity (WP)	Level 1	~250m (0.00223°)	Africa and Near East (bounding box 30W, 40N, 65E, 40S)
Actual Evapotranspiration (AET)	Level 2	~100m (0.000992°)	<i>Counties</i> <sup>1</sup> : Morocco, Tunisia, Egypt, Ghana, Kenya, South Sudan, Mali, Benin, Ethiopia, Rwanda, Burundi, Mozambique, Uganda, West Bank and Gaza Strip, Yemen, Jordan, Syrian Arab Republic and Lebanon.
Net Primary Production (NPP)			<i>River basins</i> <sup>2</sup> : Niger, Nile, Awash and Jordan and Litani.
Above ground biomass production (AGBP)	Level 3	~30m (0.000268°)	Irrigation schemes and rainfed areas in Egypt, Ethiopia (2 areas), Mali and Lebanon.
Phenology			
Harvest Index			
Reference Evapotranspiration (RET)			
Precipitation			
Land cover classification			



# Characteristics

- Supply-driven
- Government centered
- Government financed
- Use cases not yet clear
- Sustainability ?

Funded by:



Ministry of Foreign Affairs of the  
Netherlands

Partners:



UNESCO-IHE  
Institute for Water Education



Frame consortium:



UNIVERSITY  
OF TWENTE.







## *Geodata for Agriculture and Water (G4AW) improves food security in developing countries by using satellite data*



- 3 Calls
- 100 mio €
- 2014-2021

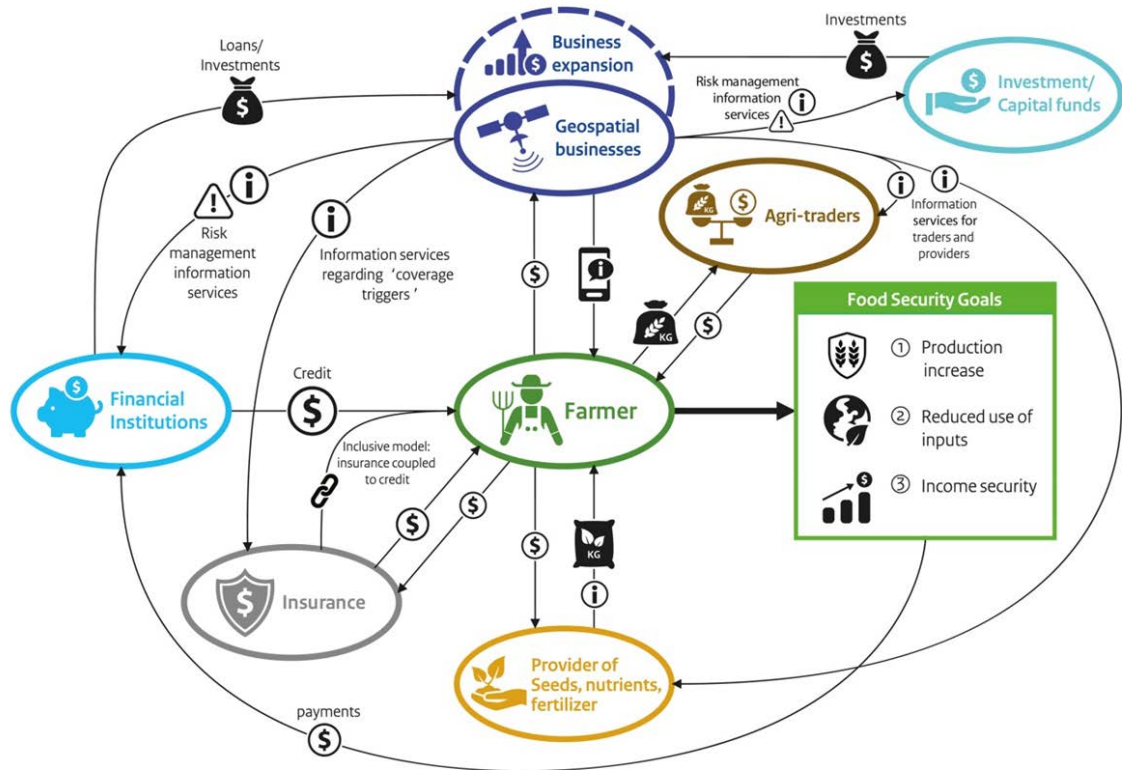
*Netherlands Space Office (NSO) is executing this programme, commissioned by the Dutch Ministry of Foreign Affairs.*



## G4AW characteristics



- User demand driven (information, not data)
- Improves food production and income of smallholders, more efficient use of inputs
- Public private partnerships, entrepreneurship
- Financially sustainable services and products at end of project
- 17 projects running in 10 countries reaching 5-10 million farmers (objective > 3 million)





## Examples of services

- More localized weather forecasts
- Yield forecasts / growth stages
- Pest & disease warnings
- Drought and flood warnings
- Micro insurance
- Risk profiling supporting insurance and credits





# Success factors

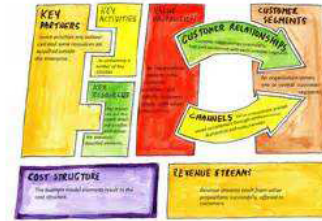
- **Business models:** Long term sustainability
- **Market-oriented:** A well-defined and specific problem
- **Solutions:** A portfolio of services, focus remains on a core offer with added value for client
- **Channel:** Build on already existing delivery mechanism(s)
- **License to operate:** Embedded in local context, business owner
- **Maturity:** Reproduce an already (elsewhere) validated service



[Download publication](#)



## G4AW business models



- **Freemium model**: free service provision  
Other paying clients are financing operations
- **Loyalty model**: free service provision  
avoid switching clients to competitor
- **Inclusive model**: paid service provision bundled into package, e.g. insurance coupled to credit, advisory to input supplies
- **Service model**: client is paying (subsidized) fee for service provision
  
- **Use of aggregators**: telecom, bank, insurance, seed/nutrient supplier, farmer cooperatives
- **Embedding** : extension officers, NGO's, farmer cooperatives

# G4AW projects

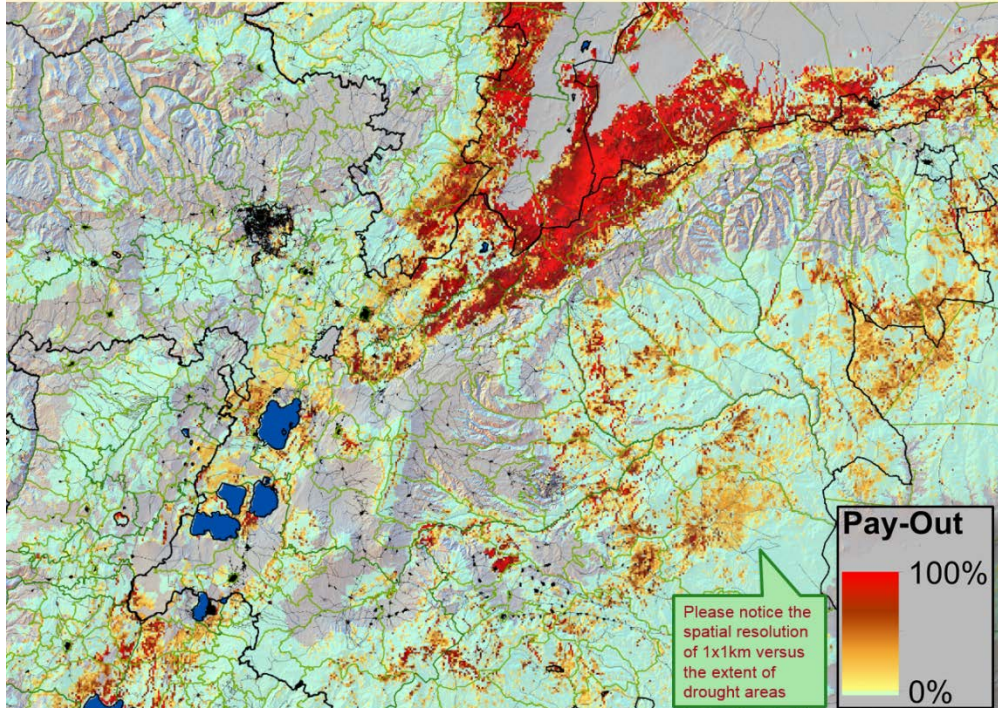


(1<sup>st</sup> and 2<sup>nd</sup> call)

Country	Project	Lead Partner	Business Model	Aggregator	Embedding
Bangladesh	GEOBIS	Lal Teer Seed	Inclusive	Seed supplier	Extension officers, retail
Bangladesh	GEOPOTATO	Wageningen Univ.	Service	Mob/ICT, gov.	Government, NGO
Bangladesh	IDSS	ACI	Freemium/Inclusive	Input supplier, gov.	Extension officers, retail, NGO
Burkina Faso	MODHEM	SNV	Service	Telcom, gov.	Extension officers, NGO
Ethiopia	CommonSense	Alterra	Service	Cooperatives, unions, MFI's	Government, NGO
Ethiopia	GIACIS	University of Twente-ITC	Inclusive	Bank, insurance, government	Government
Indonesia	G4INDO	Wageningen Univ.	Service	Insurance	Government
Indonesia	SmartSeeds	ICCO	Service	Seed supplier	NGO
Kenya	CROPMON	SoilCares	Service	Cooperative, trade association	NGO
Kenya/Tanzania	GEODATICS	ICS	Inclusive	NGO	NGO
Mali	STAMP	SNV	Service	Telcom	Cooperative
Mali/Uganda	SUM Africa	EARS	Service	Cooperative	Cooperative
South Africa	R4A	ARC	Freemium	Parastatal/SemiGov	Extension officers, NGO
Tanzania	SIKIA	TechForce Innovations	Freemium & service	NGO, government	Extension officers, NGO
Uganda	MUISS	CTA	Freemium & service	Federation, unions	Extension officers
Vietnam	Sat4Rice	Vinaned	Inclusive & loyalty	Seeds & nutrient	Extension officers, gov.
Vietnam	GREENcoffee	ICCO	Service	Telcom/ICT	Extension officers, gov., NGO



2015 Late Season – same areas were hit twice in one year!



Micro-insurance and drought warnings for millions of farmers

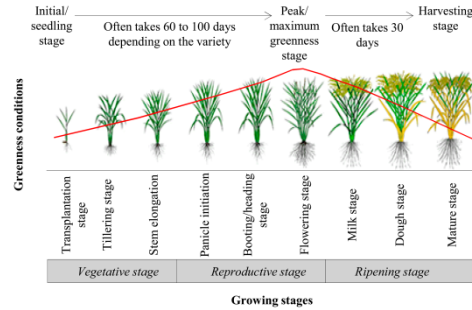
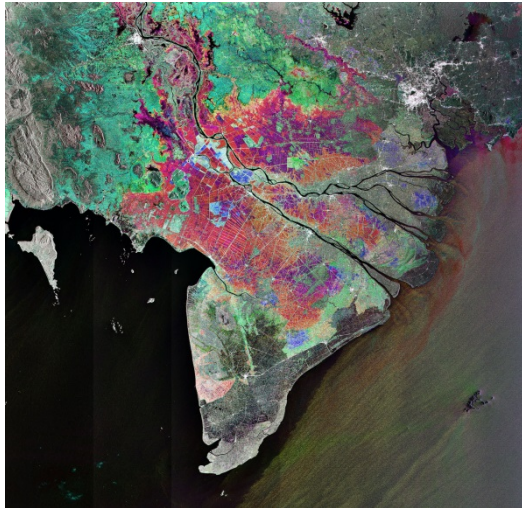
GIACIS - Ethiopia





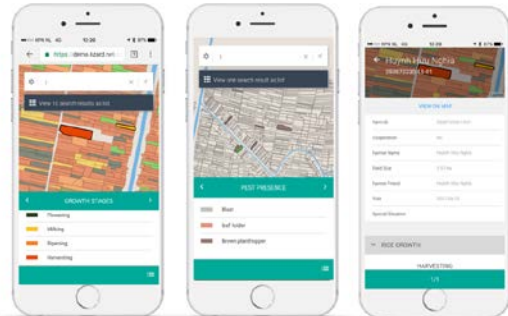


# From 2 provinces in Mekong to SE Asia?

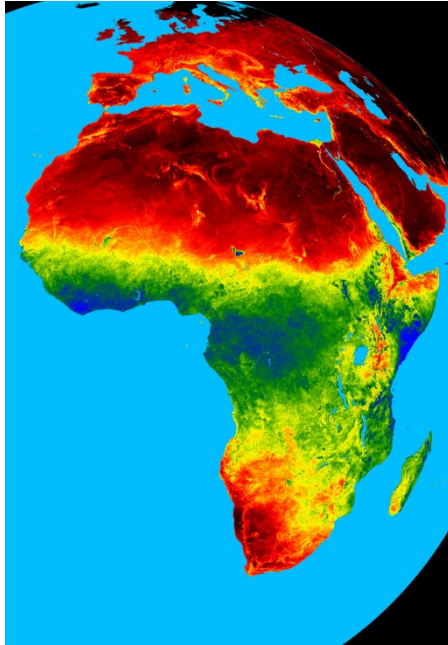


# Growth stages Yield predictions Pest warnings

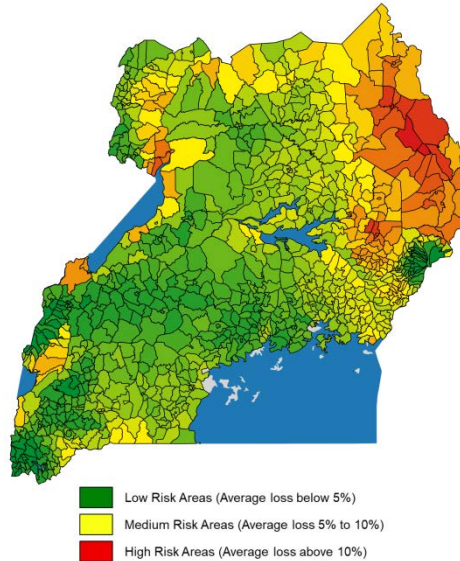
## Sat4Rice - Vietnam







Uganda Risk Rates (Generic Product)



## Micro insurance Risk profiling

SumAfrica & MUIIS  
Mali & Uganda





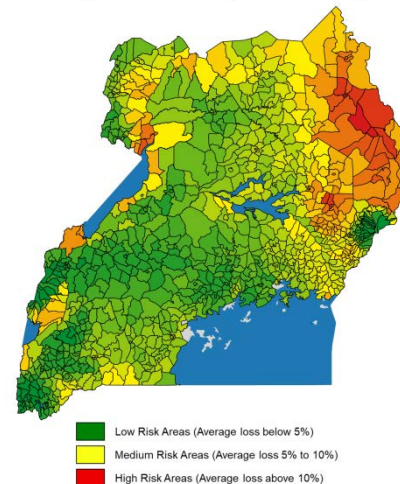
## Geodata for Inclusive Finance & Food (G4IFF)



Improve  
access to  
finance for the  
rural target  
groups



Uganda Risk Rates (Generic Product)



G4IFF is coordinated by [Dutch Platform for Inclusive Finance](#).



# Interested to see & learn more?

- [G4AW Videos](#)
- [G4AW Leaflets](#)
- [SumAfrica \(good introduction to topic\)](#)
- [NpM G4IFF](#)
- [CTA small scale farmers animation](#)
- [SwissRe animation](#)



Questions?





Thank you for  
your attention

G4AW is a programme  
commissioned by



Contact: [g4aw@spaceoffice.nl](mailto:g4aw@spaceoffice.nl)



**G4AW**  
GEODATA FOR AGRICULTURE AND WATER

Netherlands  
**Space**  
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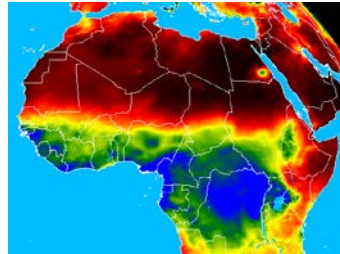




# Additional slides (for information)



# Major (technology) enablers



Satellite and other sensor systems

Operational infrastructure

Value adding services

Distribution channels



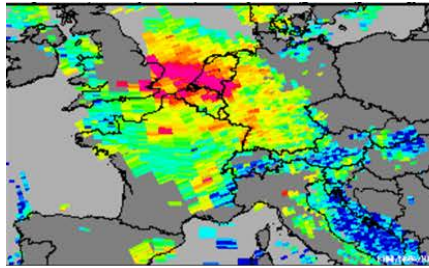
# Netherlands Space Office



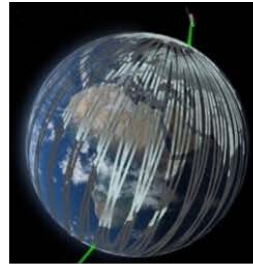
- Space agency of the Netherlands government (established 2009)
- Reporting to:
  - Ministry of Economic Affairs
  - Ministry of Infrastructure and Environment
  - Ministry of Education, Culture and Science
  - Ministry of Foreign Affairs
  - Netherlands Organisation for Scientific Research (NWO)
- Task: to develop and implement Netherlands Space programme
- Outcome: space applications for science, economy and society



# Added value of satellites



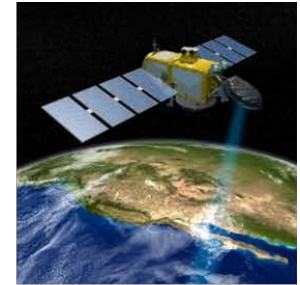
Large regions



Global coverage

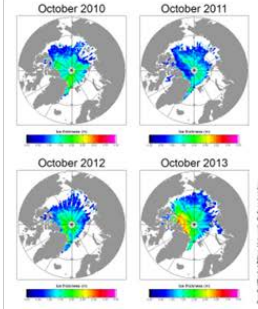


Global access



Homogeneous data

Repeated obs  
Historical data



Integration



Multiple users



Near real time





## G4AW objectives



- User demand driven (information, not data)
- Improve food production and income of smallholders, more efficient use of inputs
- Organize public private partnerships
- Stimulate entrepreneurship
- Achieve financially sustainable (advisory, insurance) services at end of project



# G4AW projects



(1<sup>st</sup> and 2<sup>nd</sup> call)

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Vietnam	GREENcoffee	ICCO	Service	Telcom/ICT	Extension officers, gov., NGO



# Lessons learned from running projects

- Local, active and strong **business partners** (business owner)
- **Previous cooperation** of project partners (trust)
- Role of **aggregators** for reaching users (scale up)
- Baseline study poorly executed (understand your client)
- Reporting (SMART MoV's) & M&E (plan & methodology)
- Actively searching synergy with other organizations and ongoing activities (efficiency & effectiveness)



## G4AW Partnerships – Public Private Cooperation

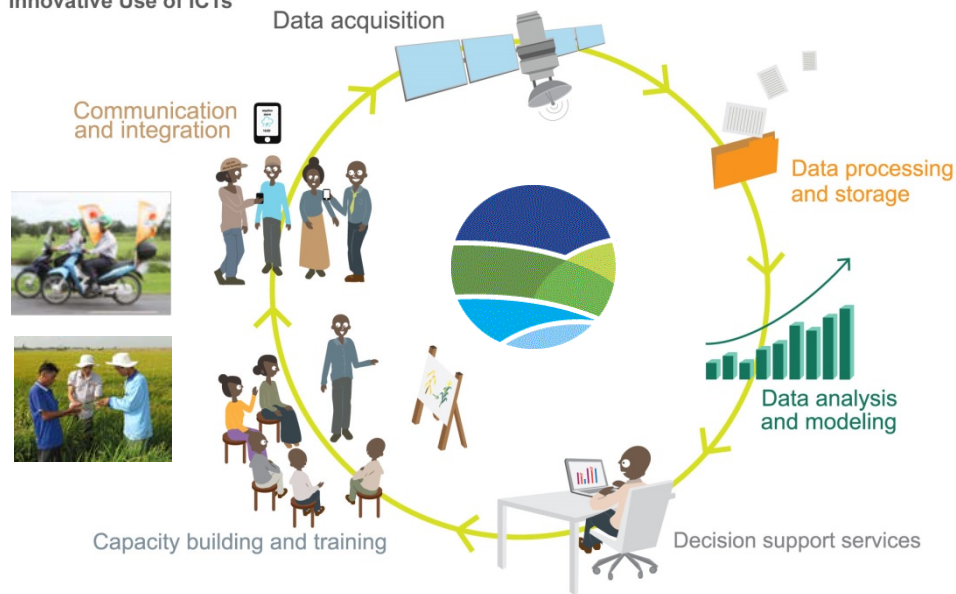
- Project objectives are ambitious and overarching competences of one single organization
- Lead partner
  - Overseeing organizational and technical complexity
  - Managerial skills
- Contributing partners for specific competences, e.g.
  - Private (business focus, data, ICT, services)
  - Public (access to data, license to operate, extension workers)
  - NGO (user engagement, capacity building/training, M&E)
  - Research/knowledge institutes (specific domain expertises)





# From data to informed decisions

Innovative Use of ICTs



- User engagement
- Understanding user needs
- Added value services
- Training & capacity building
- Delivery channels



# Business Case

## The business proposition:

- Target Group
- Demand Driven Approach
- Product & Services
- Distribution Channels

## Customer experience:

- Affordability
- Acceptability
- User Experience

Business Model

Customer Journey

Business Case Evaluation

Financial case

Partnership

## Financial Projections:

- Key Financial Criteria
- Income vs Costs
- Forecast Reliability
- Working Capital / CapEx

## Managing the business:

- Composition
- Cooperation Agreement
- License to Operate and Intellectual property



# 3<sup>rd</sup> call Key elements

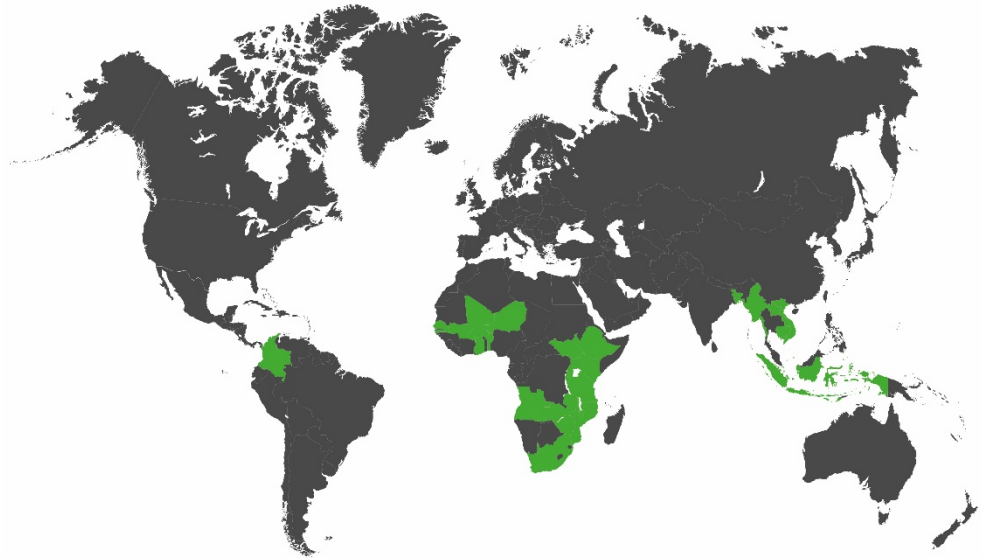


Budget	3rd call 2017 19.8 Mio € (in total 2013-2017: 60 Mio €)
Subsidy (max.)	70% for 23 countries, 60% for 3 countries in transition
Grant	between 0.5 – 3.0 mio € (2017 call)
Project	User driven, partnership, business plan, information service (satellite data are indispensable and are at the start of the information chain)
Project duration	3 years (optional 1 yr extension)
Results	Beneficial and timely agrometeorological and/or financial/insurance products
Website	<a href="http://www.spaceoffice.nl/g4aw">www.spaceoffice.nl/g4aw</a>
LinkedIn	<a href="https://www.linkedin.com/groups/8509495">https://www.linkedin.com/groups/8509495</a>



# G4AW Countries

Angola	Mali
Bangladesh	Mozambique
Benin	Myanmar
Burkina Faso	Niger
Burundi	Rwanda
Cambodia	Senegal
Ethiopia	South Sudan
Ghana	Tanzania
Indonesia	Uganda
Kenya	Zambia
Laos	Zimbabwe
Malawi	



*partner countries in transition:* Colombia South Africa, Vietnam